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OF THE

NERVOUS SYSTEM.

By J. HUGHLINGS JACKSON, M.D., F.R.C.P.,

Physician to the London Hospital for the Epileptic and Paralysed.

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I wish here to give as briefly as possible an account of the pathology of the nervous symptoms which result from syphilis. Of necessity there is considerable recapitulation from former papers I have written. For syphilis produces very different affections of the nervous system, and I have therefore had to speak of syphilis when considering Amaurosis, Epileptiform seizures, Hemiplegia, &c. It is, however, justifiable to bring together the conclusions one has arrived at about syphilitic nervous affections from the study of nervous affections in general.

A great deal of work has now been done, both in this country and abroad, on syphilitic diseases of the nervous system, and recently there have appeared the masterly lectures by Broadbent, and the most valuable book by Buzzard on these affections. It is a very difficult task to write on such a subject after these able physicians. I shall, therefore, limit myself. I wish simply to consider syphilitic nervous affections as I have seen them myself; thus my task is considerably narrowed.*

* Of syphilitic disease of the spinal cord, however, I do not wish to say anything, because I have not yet seen a single case as proved post mortem. There are very few cases of this kind with post mortem examinations on record; there ought, therefore, to be more hesitation than there is in ascribing paraplegia to syphilis.

My main object is to show that most syphilitic affections of the nervous system are very indirectly of nervous origin, and therefore that such names as Syphilitic Hemiplegia, Syphilitic Epilepsy, Syphilitic Insanity, although convenient for use in purely empirical arrangements for direct utilitarian purposes, are not scientifically accurate. They are analogous to terms used by the gardener, not to terms used by the botanist. If used in scientific statements, as I suppose for lack of others they will be, great confusion must result if we let the names be other than mere conventional labels. Just as confusion would result if the gardener's convenient terms (fruit trees, flowers, vegetables, and shrubs) were used in what purported to be a scientific account of plants. The pathological processes leading to the nervous symptoms mentioned as being syphilitic are really complex. Moreover, the conditions of nervous organs, which are the *direct* causes of the several nervous symptoms, are very different. The matter is not simple as the simple nomenclature implies. The terms mentioned are sometimes used as if they embodied clear pathological accounts; those who so use them evidently *do not even know that they do not know* the pathology of the cases of which they speak so easily.

I do really think, however, that empirical arrangements of cases of nervous disease by their most prominent features, or by signs guiding to utilitarian procedures are justifiable. Nay, I think that for practical purposes clinical entities are essential. I have much changed my opinions on this matter since reading an able paper by Moxon on Classification of Disease (Guy's Hospital Rep. Vol. xv.) Of some morbid states we have not enough knowledge to make a *scientific* classification—dyspepsia, for example. Let me give an illustration of the value of the empirical arrangement in cases of disease of the nervous system. Contrary to what I used to believe, I believe now that it is desirable for preliminary diagnosis to arrange cases of epilepsy and epileptiform convulsion according to what is the most striking feature in the cases. But scientifically the classification of epilepsies should, I think, depend on the principle that any part of the cerebral cortex may become unstable, and may discharge. For practical purposes, however, for diagnosis, for example, we must have an arrangement of cases from their most striking features, *e. g.*, into epileptic vertigo, epilepsy proper, &c. A patient comes to us for certain *symptoms*, for vertigo we will suppose; we have first to consider it as vertigo simply, in order

to find out whether it be epileptic, ocular, auditory, &c. Similarly for insanity; an empirical arrangement is, I submit, necessary for diagnosis and treatment. We should have Syphilitic Insanity, Phthisical Insanity, and the like. For obviously the most important thing for direct utilitarian purposes is the pathology and the causation. But the misfortune is that such arrangements may be taken for classifications properly so-called. They are really only provisional groupings for mere convenience. Because it is convenient to consider a whale as a fish for legal purposes, it would never do to consider it so in zoology. The only *scientific* basis for a genuine classification of insanity, that is, one analogous to the botanist's classification, is, I submit, the principle of Dissolution, the word dissolution being here used as the opposite of Evolution. For besides more direct reasons, this principle applies to most varieties of disease of the brain—to aphasia, hemiplegia, epileptic mania, and insanity ordinarily so called. But then this classification, valuable as a means of extending our knowledge, would be useless, or of little use, for *direct* practical purposes. For these we must have a nomenclature and an arrangement analogous to that of the gardener.

Whilst showing that the pathological processes by which syphilis causes nervous symptoms are usually complex and indirect, I shall show also that in these respects they simply imitate non-syphilitic morbid processes. I make this remark chiefly because I wish to give a reason for speaking in what follows more generally of nervous symptoms than the title *syphilitic* affections seems to warrant. Thus, what I shall call the Second Variety of Hemiplegia from Syphilis (that due to thrombosis of a syphilitic artery) does not differ from hemiplegia, owing to thrombosis of an atheromatous artery. Again, a syphilitic tumour in the brain acts like any other kind of tumour; and thus it would be most misleading to speak of the symptoms of it without regard to the fact that a glioma, an abscess, or an hydatid cyst, produce the same symptoms. The principle applies to every nervous symptom which syphilis produces. There is nothing in any kind of nervous symptom which enables us to diagnose syphilitic disease of the nervous system; our diagnosis is founded on associations and successions of symptoms; that is, of course, apart from obvious signs of external syphilis, which indeed make the diagnosis for us.

On the way in which Syphilis "attacks" the Nervous System.

I must premise that I know nothing of syphilitic diseases of the nervous system, except in the sense of there being disease beginning in the connective tissue of nervous organs or their arteries. I know nothing of syphilitic changes beginning in nervous tissue. It is true that in some manifestly the subjects of constitutional syphilis, who have died after having had nervous symptoms, I have found no changes in the nervous system of any kind post mortem. Of these cases, I believe it possible that syphilitic material has been absorbed. At any rate, we are not justified in drawing positive conclusions of any kind from cases in which nothing is found, especially as the cases in question are few and exceptional.

As a matter of fact, all that we really *know* of the pathology of syphilitic nervous cases is that in their earliest stage there is disease of the connective tissue of nervous organs or their arteries. It is only an inference that syphilis produces some minute change of nervous tissue enough to cause nervous symptoms and death, but not coarse enough to be discoverable post mortem. I do not deny that this may happen, but I confess I do not see the evidence for it. All we can demonstrate of the doings of syphilis in producing nervous symptoms is that it first leads to changes in connective tissue. This being so, it is plain at once that all we know of the pathology of the whole group of syphilitic nervous affections is that they are primarily *non-nervous*. Here is a particularly valuable illustration of a wide general truth of great importance. It is evident that almost all so-called *nervous diseases* of which the pathology *is* known are primarily of non-nervous origin, that is to say, the pathological change in the nervous organ begins in a non-nervous constituent of that organ, the lesion of the true nervous elements being secondary. In other words, the nervous tissue is not *in fault*, it *suffers* because its companion tissues have become diseased.*

But there is more than this. We have to point out that the action of syphilis in producing the more important nervous symptoms is not, in most instances, direct even in the sense that the over-growth of connective tissue it causes

* It is for this reason that I have urged that we should make a distinction botwixt the physiology (abnormal, of course) and the pathology of a case of nervous disease. There are the two (abnormal) physiological conditions of nervous tissue (loss of function and over function). The pathological processes beginning in non-nervous tissues of nervous organs, by which the loss of Function or the over-Function result, require separate investigation.

directly damages nervous tissue. It is convenient, however, to speak of these cases as owing to the direct action of syphilis. A syphilitic neuroma is an example of direct damage by syphilis in this limited sense of the word direct. For the over-growing connective tissue constituent of the nerve trunk then and there squeezes the nerve fibres it lies among. But we shall see that other nervous symptoms are produced by syphilis in a far more indirect way. Hence I would say again that such expressions as "Syphilitic Epilepsy," "Syphilitic Insanity," are not precise enough for use in scientific statements. He who has justifiably concluded that a patient's nervous symptoms are "caused by syphilis," has not come to a conclusion on which he can rest; he is in most cases only at the starting point of a pathological inquiry. We will consider the several affections seriatim.

Palsies of Cranial Nerves.

The pathogenesis of Syphilitic palsies of cranial nerves is too simple to need much comment here. It is squeezing of nerve fibres by over growths of the connective tissue element of the nerve trunk. There, are, however, one or two clinical matters involved indirectly to be mentioned categorically.

Smell.—Subjective sensations of smell are occasionally met with in nervous patients, and they may occur in patients who have other nervous symptoms from syphilis. They may be mistaken for smells arising from disease of the bones of the nose, especially as in some cases there is a slight nasal discharge. The discharge, however, is not offensive to other people, and thus is no evidence of local organic disease in the tissues of the nose. The smells which these patients have are analogous to the coloured vision of some amaurotic patients.

Sight.—Amaurosis occurring with other symptoms attributable to syphilitic disease of the brain may be put down, as a matter of course, to syphilitic changes in the deep tissues of the eyes, choroido-retinitis, by those who do not use the ophthalmoscope. This is a very grave error. It is true that amaurosis, in such cases, *may be* due to syphilitic changes localised in the *fundus oculi*, but as a mere matter of fact, it scarcely ever is. It is nearly always owing to optic neuritis or to atrophy, the sequel of that neuritis. Now, "optic neuritis from syphilis" is not "syphilitic optic neuritis." The optic neuritis produced by a syphilitic tumour is just like

that produced by a glioma, or by any other adventitious product in the cerebrum or cerebellum.

I know of no evidence to prove that optic neuritis is produced either by syphilitic disease actually involving the optic nerve trunks inside the cranium or by syphilitic meningitis at the base.* I speak of post-mortem evidence; clinical evidence in not sufficient.

I never saw a neuroma of the optic nerve. I do not remember seeing simple atrophy of the optic nerve (atrophy not the sequel of neuritis) in a patient who had other nervous symptoms inferentially due to syphilis, to say nothing of never seeing post-mortem evidence of intracranial syphilis in such a case. The other kind of optic atrophy† is often seen.

Here it is important to remark that amaurosis from syphilitic choroido-retinitis is really a syphilitic disease of the nervous system, quite as much so as a syphilitic neuroma is. There is syphilitic disease of connective tissue of a nervous organ, the nervous elements suffering secondarily. He who speaks of amaurosis from optic neuritis due to syphilitic gumma in the cerebrum, and amaurosis owing to syphilitic choroido-retinitis, as if they were alike, calling them "Syphilitic Amaurosis," without qualification, is not speaking scientifically. It would be like speaking of a whale and a salmon as being zoologically alike.

Paralysis of Ocular Motor Nerves and Vertigo.—Paralysis of an ocular motor nerve is a cause of vertigo. Now, the vertigo may be the symptom which the patient has first of all; that is, he has vertigo before there is actual double vision, or obvious strabismus. It would be a great blunder to say of such a case in a patient the subject of syphilis, "In this case the vertigo was the first symptom of the syphilitic disease of the brain, and then palsy of the sixth or third nerves occurred." In reality the vertigo would, in all probability, be owing to paresis of an ocular muscle, before actual demonstrable palsy of it occurred.

* I know nothing of syphilitic meningitis. Need I say that I except cases of meningitis from *bone* disease, the result of syphilis.

† I may here remark that I only know of one kind of change in the optic nerves from intracranial tumour, syphilitic or other, and this I call optic neuritis. There are all degrees of this change, from a climax of great swelling with hæmorrhages to white atrophy. I do not recognise a swollen or choked disc, from raised intracranial pressure. There is a swelling of the disc in some cases of tubercular meningitis and pyæmia. The swelling is, I believe, from venous thrombosis; but I have had no demonstration of it.

The vertigo* continues, of course, when the palsy is established.

Anyway it would be very misleading to call vertigo, so caused in a syphilitic patient, "syphilitic vertigo," for all syphilis does, in such a case, is to damage a nerve bundle, and vertigo would attend paralysis of an ocular motor nerve, however caused. It is an error easy to fall into. If the motor nerve affected be the fourth, the ocular palsy is not obvious, and may be overlooked. And when there is evident paralysis of the third nerve, the vertigo resulting from it may be erroneously put down as a symptom independent of that palsy, and due to implication of a nerve centre. But be it remarked that the expression "Syphilitic Vertigo" is just as warrantable as is the expression "Syphilitic Epilepsy." The expression sounds more grotesque, simply because it is novel.

The Ear.—Syphilis may produce disease of the auditory nerve, as it may of any other cranial nerve trunk. This needs no comment. Syphilis may produce disease of the tympanum, just as it may produce iritis and choroiditis. Having done this there may arise (as from common tympanic disease after scarlet fever) paralysis of the face from implication of the portio dura nerve in the Aquæductus Fallopii. To say that this facial paralysis is "caused by syphilis" would be a most unmethodical statement. It would be as erroneous scientifically as the expression "Syphilitic pyæmia" would be for pyæmia arising from disease of the bone, because that bone disease was syphilitic, or as "Syphilitic Vertigo," for the vertigo from syphilitic paralysis of a motor ocular nerve. It would be an assertion too grossly misleading to be made by any careful clinician. I give the illustration because it shews well the indirect way in which syphilis can produce even a very local one-sided paralysis.

Menière's Disease. — Syphilitic ear-disease may produce severe nervous symptoms which may be erroneously put down to the direct action of syphilis on the nerve centres. The syphilitic ear-disease may cause attacks of vertigo with reeling and vomiting (Menière's disease). It would be very unmethodical to say that these symptoms were "caused by syphilis," for that expression might be taken as implying that syphilis had direct action upon the nervous centres in producing the vertigo. If a patient had from disease of the

* It is not due to diplopia, as is commonly supposed, but to erroneous estimation of position of objects by the one eye which is lamed.

nervous *centres* an attack so violent as are many attacks of auditory vertigo, he would be very dangerously ill. A careful clinical observer would at once suspect the far less serious thing, ear disease, if a patient had an attack of severe vertigo, deep pallor, reeling and vomiting without loss of consciousness. The fact is that in such a case syphilis has damaged the ear, and then as a next and completely independent step, ear-disease (exactly as similar disease caused by any other pathological process might do, or as syringing the ear in some people does) produces attacks of Menière's disease.

Aphonia from Syphilitic Disease of the eighth nerve.—Disease of the eighth nerve produces (among other symptoms, doubtless) paresis of the palate and paralysis of the vocal cord; the presumption is, that the part of the eighth nerve affected, corresponding to these palsies, is the bulbar part of the spinal accessory. From the laryngeal palsy there is of course aphonia. I have seen several cases (proved post mortem) in which syphilis caused aphonia, by attacking the eighth nerve within the cranium. In all these cases, the palsy was demonstrated during life by the laryngoscope, thanks to my colleague Dr. Morell Mackenzie; the larynx, except for atrophy of the paralysed muscle, was structurally healthy. In a man whose body presented obtrusive signs of syphilis, it would be an easy fallacy to suppose that his aphonia was owing to syphilitic disease of the tissues of the larynx itself. I have several times written on this variety of "Syphilitic Aphonia." The misleading nature of such a term is obvious. It is as bad scientifically as the expression "Syphilitic Strabismus" would be, but quite as good as some other expressions I speak of in this paper.

Acute Cerebral Disease from Syphilis.

As before remarked, I know nothing of syphilitic meningitis. I do not speak of meningitis from syphilitic disease of the cranial wall; this is really bone-meningitis, and has nothing to do with our enquiry. Syphilis, however, will produce a set of symptoms which I am sometimes unable to distinguish from those of meningitis. But when I say I know nothing of syphilitic meningitis, I speak of post-mortem examinations. What I have found after death in these meningitis-like cases is not meningitis, but a syphilitic mass, a veritable tumour, with some softening of brain near it.

There is, I suppose, a local encephalitis produced by irritation, the tumour acting as a foreign body. The acute illness I speak of is producible by a glioma, by an abscess, or by local coarse disease in the brain of any kind. It, in its symptoms, may be like meningitis, tubercular, or traumatic. Indeed, I use the general and gardener-like term "Acute Cerebral Disease" as Trousseau did the term "Cerebral Fever," because there is a set of symptoms which occur from severe acute disturbance of brain by the very different processes stated. The symptoms are, headache, vomiting, irregular pulse (often slow), constipation, retracted belly, emaciation, altered temperature (often low, normal, or little under; never very high). These are what may be called general nervous symptoms; they may be complicated with special nervous symptoms, as for example, convulsion, hemiplegia, &c.

If the patient recovers from this acute condition, with or without iodide of potassium, one is not justified in ascribing the symptoms to a meningitis of any kind. In cases of recovery, on which, after some subsequent fatal illness, I have had autopsies, I have found in syphilitic subjects old syphilitic disease, but not traces of past meningitis. I believe that patients do occasionally recover from meningitis, because I have found traces of it post mortem in a few cases. But of recovery from syphilitic meningitis I have no evidence. It is not relevant to speak of syphilitic patients who had "all the symptoms of meningitis," for there are no symptoms characteristic of meningitis only. Such symptoms, I repeat, occur in cases of local gross cerebral disease, without meningitis. I believe that meningitis is supposed to have existed in these cases of recovery simply *because the patients have recovered.* It is assumed, that if there were tumour, the illness must have proved fatal. The reply to this is, that patients do recover from severe illnesses with symptoms like tubercular meningitis, but really owing to tumour, glioma for example; autopsies prove this in those cases where the patients die of some later illness under our care.

With glioma, syphiloma, and other foreign bodies, the symptoms are usually much more spread out, more chronic, than in tubercular or traumatic meningitis, but occasionally one cannot tell whether a patient's Acute Cerebral Disease is meningitis or tumour. If there be optic neuritis, tumour or other adventitious product is very probable; that diagnosis is practically certain, if the neuritis existed before the

illness became acute; then there would be a step towards the diagnosis of syphilitic tumour. But only a step, for the positive diagnosis of syphilitic disease, even in such a case is only to be made either (1) by the presence of outward signs of syphilis (here the diagnosis is really made for us); or (2) by there being, or by there having been, local nervous symptoms in disorderly association or succession, of such kind as palsies of cranial nerves, slowly coming on paroxysms of convulsions, &c.

Of course there are mental symptoms in cases of Acute Cerebral Affections from syphilitic disease of the Brain. They are not prominent features. In the first place, they are usually Negative. There is indeed a hebetude, a slow evenly-dull indifferent state of mind which is almost characteristic of cerebral tumour, but not of syphilitic tumour in particular. Syphilis rarely produces a striking degree of Positive mental symptoms, I mean such symptoms as delusions, illusions, grotesque actions, &c. But this remark applies to all kinds of gross local organic disease of the brain, and to all varieties of meningitis. Of course I am speaking of that I see in general Physician's practice. In the wards of a hospital, positive mental symptoms usually occur in patients who have non-nervous ailments; they occur acutely, as in erysipelas, pneumonia, rheumatic fever, and more chronically as in phthisis and other debilitating illnesses. They do occur in meningitis, but are not the most prominent features; they are so far from being characteristic of meningitis, that they are of very little value in diagnosis. Whilst mental symptoms attending any sort of disease, of necessity imply disorder of the brain, they do not necessarily, and not even in most cases of acute disease, point to *primary* changes there. I repeat, that the striking symptoms of primary disease of the brain are not usually mental, as superficial considerations would lead us to expect, but disorder of circulation, respiration, and temperature, vomiting, headache, &c. The reader will bear in mind that I still speak of cases seen in general Physician's practice. Were I told that one of my patients in the London Hospital was delirious, I should think it most probable that he had no primary disease of the brain, but that he had some such illness as pneumonia; but if I were told that a patient had a pulse of 60, that each beat was quick and shotty, that the pulse-rate was not intermittent, but now a little faster and now a little slower, without any evident regularity in these

irregularities, I should feel pretty confident that he had severe primary disease inside his head. *

There are no symptoms, "mental" or "physical" which are *characteristic* of Acute Cerebral Disease from Syphilis.

I wish to supplement what I have said on Acute Cerebral Disease from Syphilis, by the following quotation which gives the results of observations by two of our ablest English pathologists. It will be seen, however, that Wilks and Moxon consider Syphilitic Meningitis to be rare.

"*Syphilitic Meningitis.*—We have occasionally, though rarely, met with a primary pia-arachnitis in cases of decided constitutional syphilis. These cases resembled tubercular meningitis more than the acute simple form. But there was more lymph effused, and the tubercle granulations were absent. In neither of the cases was there a syphilitic affection of the dura mater. The disease was acute. Lancereaux mentions a few such cases, and we are convinced that syphilis is an occasional cause of acute meningitis."—*Pathological Anatomy by Wilks and Moxon*, p. 213.

Convulsions from Syphilis (Epilepsy and Epileptiform Seizures).

I speak of chronic cases.—In most cases, the convulsions or epileptiform seizures which syphilis causes begin locally by a very definite "aura," and mostly in the hand or side of face. In my practice of general medicine I find it so. Convulsion from syphilitic brain disease may, however, simulate those convulsions with loss of consciousness which are often called "genuine epilepsy." For my present purpose, it suffices to hold that syphilis does produce convulsion of any sort whatever. I will describe the only way in which I know it to produce convulsions. We shall see that syphilis acts very indirectly in producing this nervous symptom. There is first a growth of connective tissue (a gumma) on the brain's surface. But, convulsion being a nervous symptom, we must speak of the condition of the nervous element of which it is symptomatic. We have only spoken of an overgrowth of a subordinate element. It is plain that a convulsion is the result of an excessive discharge of grey matter. Evidently the gumma (an overgrowth of connective tissue) cannot discharge. Now whether, as I think, the grey matter

* From facts of this kind I have long been driven to the conclusion that the units of the cerebral hemisphere represent, not only the large muscles of the body, but the heart, viscera, &c. It seems to me, that this is a conclusion one must reach *à priori*, if we take careful note of emotional manifestations.

near the gumma is that which morbidly discharges, or whether the discharge be of grey matter in the medulla oblongata, as most physicians suppose, what is quite certain is, that the convulsion is produced because the syphilitic disease, the gumma, induces changes in grey matter somewhere. I call these changes in grey matter changes of instability; they constitute a locally abnormal physiological condition of grey matter. What the minute links of the pathological process betwixt the gumma and those changes are we do not know. From another point of view, these changes constitute what I call a "discharging lesion." Whatever their nature may be, or wherever they may be, there is a certainty that they are changes *secondary* to the syphilitic disease; they are not syphilitic, but the indirect results of a syphilitic mass. It is on this secondarily induced change in grey matter that the occasional discharge producing the convulsion directly depends. The clear demonstration that the instability of grey matter is not itself a syphilitic change, is, that convulsions are producible by any other sort of tumour, glioma for example, of the convolutions. A syphilitic mass is indeed only one of the foreign bodies which can produce changes of instability. A gliomatous tumour in the region of the corpus striatum may produce just the same kind of convulsion, with or without loss of consciousness, as a syphilitic tumour in that region may do. Should we be using scientific language if we said there was "gliomatous epilepsy?" The syphilis in these cases acts indirectly, just as it does in producing optic neuritis. We often indeed find optic neuritis and convulsion together, from local syphilitic disease of the brain. In such cases, there is a gradual formation of a syphilitic mass in the brain; the mass being formed, next acts, not in its special character as a syphilitic mass, but in its general character as a "foreign body." It, just like any other foreign body, produces changes in the optic nerves on which defect of sight depends; it produces changes of instability in grey matter on which convulsion depends. We shall have more to say of convulsion when we consider the third variety of syphilitic hemiplegia.

Softening of the Brain from Syphilis.

Of universal or widespread softening of the brain I know nothing. I have not seen such a thing post mortem, except of course as the result of decomposition. The cases popu-

larly called "softening" are cases of nervous exhaustion or cerebral atrophy. All I know of "softening" is of softening locally. The pathological processes causing local softening (excluding injuries, direct effects of meningitis, and the like obvious cause) are 1, adventitious products, and 2, blocking of arteries or veins. The adventitious product may be a syphilitic growth; the softening it causes is about the growth. I believe it is a later and more extreme degree of that change by which the symptoms, Convulsions and Acute Cerebral Disease from tumour, are caused (see those sections), that is to say a late stage of encephalitis. [For "syphilitic softening" from blocking of cerebral arteries, see remarks on second variety of Syphilitic Hemiplegia and on Aphasia.]

Hemiplegia.

There are three varieties of Hemiplegia from syphilis; hence, it follows, that the term "syphilitic hemiplegia," being a name for three different things, cannot be a precise expression. To speak of "curing cases of syphilitic hemiplegia" is to speak carelessly.

First variety of Syphilitic Hemiplegia.—A gumma grows in the motor tract itself, then and there it slowly squeezes nerve tissue, and in this way causes paralysis straightway. The process of causation here is obvious. This variety of syphilitic hemiplegia is very rare indeed. The paralysis comes on slowly.

Second variety of Syphilitic Hemiplegia.—(Local softening of the brain.)—Hemiplegia comes on because the middle cerebral artery (or some branch of it), being gummatous, becomes blocked up; there is local softening of the parts which the vessel should supply, from thrombosis of it. This is the simplest illustration which can be given, of the very indirect way in which syphilis can cause a nervous symptom. For plainly the hemiplegia here depends directly on local cerebral *Softening*, which is a change quite as non-syphilitic as if the artery blocked had been blocked by an embolus, or as if there were thrombosis, because the artery was atheromatous. Indeed in the latter case, the term "atheromatous hemiplegia" would be as justifiable as "syphilitic hemiplegia," and for certain practical purposes, and for empirical arrangements, it might be useful.

In these cases, anti-syphilitic treatment can do no more good than it will do for softening from embolism; in fact drugs would do no good at all. But, unfortunately, there is

often a misunderstanding about the influence of remedies in such cases. For instance, it may be replied "however indirect the pathological process may be, anti-syphilitic treatment *does cure* a patient of syphilitic hemiplegia." It is really no answer. In the first place, by the statement that iodide of potassium does no good for the kind of syphilitic hemiplegia we are considering, I do not mean to say that the patient may not get rid of his paralysis whilst he is taking that drug. Next, I deny that there is any evidence that the patient is cured by it. It is not sufficiently known that if the damage to the motor tract which causes hemiplegia be limited, the patient will get well without drugs, and this is so, whatever the nature of the damage may be—clot, or softening however caused. The statement one occasionally hears (1) that a patient cannot recover from paralysis when part of a motor centre is permanently wanting, and (2) the statement that prompt and complete recovery shews that there "could not be" a destructive lesion, are simply not true. From not knowing that recovery is spontaneous in many cases of hemiplegia from local damage, erroneous conclusions are come to on therapeutics; the patient may get well of this variety of syphilitic hemiplegia, but our drugs do not cure him.

Third variety of Syphilitic Hemiplegia (Hemiplegia after a Convulsion).—There is hemiplegia, almost invariably transitory, after a convulsion. This form of hemiplegia (the epileptic hemiplegia of Dr. Todd) is so very indirectly owing to syphilis that the convenience, even for utilitarian purposes, of the expression "Syphilitic Hemiplegia" is very dubious indeed. Syphilis is one of the commonest causes of this variety of hemiplegia. The causation is, however, we shall see, very indirect.

We find post mortem in such cases a gumma in the membranes growing into the convolutions. What happened, I suppose, was that the gumma was first formed. Secondly (as explained under the head of Convulsion), the gumma, as a "foreign body," causes localised instability of grey matter —causes a "discharging lesion." The gumma is syphilitic, but the "discharging lesion" is not, for a similar one is producible by a glioma. Thirdly, the convulsion is a result of a strong discharge of the locally unstable grey matter. Now for the fourth step, which brings us to the symptom spoken of. In some cases the patient is paralysed after the convulsion, that is, when the cerebral discharge is over. According to

the degree of the discharge he may be weak of one side or perfectly hemiplegic, even with lateral deviation of the eyes. If, however, the convulsion has been local, the subsequent palsy will be only of the parts first and most convulsed. The paralysis is, I think, *a consequence of the discharge*—an after effect of a very excessive discharge. The fact that it is in the parts first and most convulsed, that it occurs often in cases where there is no loss nor trouble even of respiration to imply cerebral congestion or extravasation, and that it is transitory, render the inference warrantable, that the paralysis directly depends on exhaustion of nerve fibres in the corpus striatum,* which "carried" the violent current in the convulsion. I venture on the generalisation *that excessive nervous discharges temporarily paralyse the nervous region in which they begin and through which they spread.* The importance of this generalisation is in the application of the explanation of epileptic hemiplegia to mania after epileptic paroxysms. We now see that this variety of "Syphilitic Hemiplegia" is a very indirect result of syphilitic disease of the brain. To recapitulate. The order of events is (1) Formation of an overgrowth of connective tissue; (2) Induction of changes of instability in neighbouring grey matter; (3) Occasionally excessive discharge of that grey matter; (4) Temporary exhaustion of nerve fibres in the corpus striatum representing the parts paralysed.

Supposing, however, that my speculation is incorrect, and supposing that the usually accepted† speculation is correct, viz., that the paralysis after convulsion is due to congestion, or to extravasation of blood, or to both occurring in the paroxysm. The fact, even then, is that the paralysis is very indirectly owing to syphilis, for neither the extravasation nor the congestion are syphilitic changes.

Apart from all kinds of speculation the facts are that there is permanently a gumma in the vertex, only occasional convulsion and only paralysis when the convulsion is over, and that paralysis is temporary. Such cases are not at all uncommon.

* I used to say (Study of Convulsions, St. Andrew's Transactions, 1870) "of the nerve fibres which pass from the part discharged to the muscles convulsed."

† Really this cannot possibly be the explanation, because there will occur after convulsion absolute, and yet transitory, paralysis of a part, of the arm for example, when there has been no trace of affection of consciousness, and not the least embarrassment of respiration in any part of the convulsion. Moreover, the convulsion has affected most the parts paralysed, a "coincidence" not explainable on the theory here disputed.

In cases of this variety of hemiplegia there may be errors as to the effects of drugs. It must never be forgotten that hemiplegia, after a convulsion, due to organic disease of the brain's surface, such as syphilitic gumma or glioma, is nearly always transitory. Unless there be a repetition of the convulsion, the hemiplegia will pass off in a few hours or days, sometimes leaving the side affected a little weak, although not obviously paralysed. So then if the patient took drugs an inexperienced person might suppose that he cured his patient of "Syphilitic Hemiplegia." There are cases in which *absolute* paralysis after a convulsion will pass off in a few hours. The most careless man would not suppose that iodide of potassium or mercury had caused so rapid a disappearance.

Syphilitic Aphasia.

What has been said of varieties of Syphilitic Hemiplegia applies *mutatis mutandis* to three varieties of Syphilitic Aphasia. It is to be noted, however, that so far as I know, neither syphilitic nor any other kind of tumour ever causes any considerable defect of speech. It never, I believe, causes entire loss of speech, as softening and clot often do. Of course one finds aphasia from softening due to thrombosis of a syphilitic (left) middle cerebral artery; we find it with the second variety of syphilitic hemiplegia. Epileptic Aphasia, analogous to Epileptic Hemiplegia, is not very uncommon in syphilis. The term Syphilitic Aphasia, like Traumatic Aphasia, may be useful as part of a gardener-like arrangement of cases, but it has an odd sound.

Mental Symptoms from Syphilis (Syphilitic Insanity).

That sufficiently extensive destruction of the cerebrum by any process may produce a degree of the negative mental condition, imbecility, is obvious. And, of course, syphilitic tumours may be the destroying agents directly by squeezing, or by leading to softening; or syphilis may more indirectly cause local softening by leading to arterial changes permitting thrombosis. We have already seen that syphilis leads to the negative mental condition of aphasia. However, it is not the custom to consider aphasia as a mental symptom, although really the person who has lost speech has lost a most special part of his mind. I believe, also, that syphilitic disease leads (as do other morbid processes) to another negative mental symptom as special as aphasia (imperception).

We have spoken of negative mental symptoms (he-

betude, &c.), from tumours, syphilitic or other. But not only are there negative mental symptoms, there are positive mental symptoms, *e. g.* illusions, delusions, hallucinations, ravings, and grotesque actions. It is very important to keep distinct these two kinds of symptoms, negative and positive, for they are not only utterly different, as *symptoms*, which is obvious, but utterly different in their pathogeny. It is of the positive symptoms that I wish to speak most. Now, so far from the positive class of mental symptoms being the *direct* result of syphilis, they are never, I think, the *direct* result of any morbid process whatever. It is to me incredible, that any morbid process can be the direct cause of even such caricatures of healthy mentation* as delusions, illusions, &c., are. On the contrary, the negative symptoms are always, in cases of insanity depending on disease beginning in the brain, due directly to morbid changes. Hence the statement "utterly different in their pathogeny," is not too strong a one. If this is so, I ought, were this the place and were there space at my disposal, to consider insanity much more widely than its production by syphilis demands, even in order to show how syphilis itself acts; I must, however, be content with barely stating the most general principles involved. It is in a general review of the causes of insanity, that the Principle of Dissolution, adverted to at the beginning of this paper, comes in. There is also another, the Principle of Loss of Control. Insanity is Dissolution beginning in the very highest centres. We have now to consider how the positive symptoms result.

I adopt the teaching of Monro, that there is in Insanity both a negative and a positive element; the principle stated by Anstie, that the apparent exaltation of certain faculties in disease is owing to removal of controlling influences. The same principle was independently stated by the late Thompson Dickson. (I do not follow Dr. Dickson, however, in his application of the principle to the epileptic or epileptiform paroxysm.) The Principle of Loss of Control, taken with the Principle of Dissolution, seems to me to apply to all cases of Insanity, and evidently to epileptic mania. Let us state them together, in order to show the relation of the Negative and Positive Symptoms.

Dissolution beginning in the highest centres "causes

* As to peculiarities of insanity, in such cases as those called Phthisical Insanity, I must say that I see no other explanation than that these peculiarities arise, not from the particular morbid process, but from the inherited or acquired temperament of the patients who become insane.

directly" the Negative Symptoms of Insanity, but it only "permits" the Positive Symptoms by removing control from those centres next to the highest.

I must not pursue this subject further. I refer the reader for evidence in support of the doctrine, to chapters on "Epilepsy—Medical Press and Circular," December 9th, 1874. The following quotation from that chapter may serve to show in outline what my opinions* on the Classification of Insanity are:—

Cases of insanity should, I think, be classified and investigated on the basis supplied by the doctrine of Evolution of nervous centres. We shall have enormous help in the work Spencer has done in his "Psychology." We have already explained that we use the term Dissolution as the opposite of Evolution. Insanity is Dissolution beginning in the highest nervous processes. The highest processes form the anatomical substrata of consciousness. In insanity there is partial or total loss of use of the highest processes, the symptom being loss or "defect" of consciousness. Metaphorically speaking, the disease is of the controlling processes. These are negative statements. There is, stated from the positive side, reduction to a more automatic condition of mind, or, physiologically stated, a "lowering of adjustment." (*See* Chapter II., Part 2, Oct. 21, page 350.) The elements of the duplex condition, dissolution and automatic action, are in inverse proportion. The "shallower" the dissolution, the higher and more special (more nearly normal) is the automatic mental action permitted; the deeper the dissolution, the more general is the automatic action. *The ravings, grotesque actions, visual and auditory hallucinations, &c., are due to action of centres which, except for over-excitement from loss of control, are healthy.*

Epileptic Mania from Syphilis.

Mania follows those epileptic paroxysms in which there is loss of consciousness at the onset of, or very early in, the paroxysm. This is equivalent, I consider, to the statement that it follows in cases where the discharge begins in the very highest nervous centres. That syphilis produces paroxysms of this kind (commonly called genuine or true epilepsy) is certain, although it more commonly produces paroxysms in which loss of consciousness is a late event in the paroxysms.†

* I have stated that such a classification is not intended for direct utilitarian purposes; for these we must have empirical arrangements.

† I would here urge again that the absolute distinction of epilepsies into cases in which consciousness is lost, and cases in which it is not lost, is not a distinction of either anatomical or physiological parentage. It is probably due to the common metaphysical habit of mind, which considers consciousness to be an entity. The distinction, even empirically, is into cases in which consciousness is lost, first of all, early or late, in the paroxysms.

I do not remember, however, as coming under my own care any case of mania after a paroxysm of epilepsy (petit mal or grand mal) in a patient whose body presented conclusive evidence of syphilis. I have seen no autopsy in such a case. In all cases of epileptic mania, I should, however, apply the generalization reached when an explanation was given of epileptic hemiplegia. There is, I consider, after the discharge beginning in the highest nervous centres, a temporary exhaustion of them, just as there is of the corpus striatum in epileptic hemiplegia. The raving is, as I suggested in the last section, the result of action of lower nervous centres, which are left temporarily uncontrolled as a consequence of temporary exhaustion of the highest or controlling centres. There is a duplex condition—(1) loss of consciousness, and (2) greatly increased automatic action.

Epileptic mania is acute temporary insanity; but there is a corresponding duplex condition in insanity ordinarily so-called; there is, negatively, defect of consciousness and positively slightly increased automatic action (delusions, illusions, &c.) In no case can syphilis be the *direct* cause of positive mental symptoms.